digital bitstream (value=0 or value=1) is multiplied by digital values (value=0 or value=1) of the respective phase current ix (also measured by means of a delta-sigma ADC), that is, the respective phase current ix is weighted on the basis of the available digital bit stream and, in particular, switching functions are derived for the individual phases as the basis for determining the intermediate circuit current as a function of the potential changes by using a digital bit stream, which represents a form of switching function or which has an inherent switching function. Digital signal processing allows the influence of rising and falling edge to be taken into account. In this manner, a precise calculation of the intermediate circuit current izk is obtained. An additional advantage of this expansion stage is the possibility of achieving a particularly high diagnostic coverage (diagnostic coverage according to ISO26262) of the current sensors of 99% by correlating the measured current values ix with the measured voltage values ux using a model of the electric drive. For this purpose, the measured current values ix and the model current values ix' resulting from the excitation of a drive model with the measured voltages ux are compared. This is particularly successful because the real terminal voltages at the drive are known and no errors are introduced by the power inverter. In sum, this results in an accurate calculation of the intermediate circuit current izk, whose input values, the phase currents ix, have a high diagnostic coverage. This allows core requirements from the technical safety concept to be fulfilled.

What is claimed is:

1. A method for determining an intermediate circuit current of a power converter with switches for converting a direct voltage into an alternating voltage, comprising:

measuring output currents of individual phases of the power converter;

measuring output voltages of the individual phases of the power converter;

determining switching functions of the individual phases that are assigned to the switches of the power converter;

determining, based on the measured output voltages, potential changes of the output voltages of the individual phases from negative potential to positive potential and from positive to negative potential;

correcting the switching functions of the individual phases as a function of the determined potential changes; and

determining the intermediate circuit current as a function of the measured output currents of the individual phases of the power converter and as a function of the corrected switching functions that are assigned to the switches of the power converter.

2. The method according to claim **1**,

wherein the switching functions are corrected by forming correction variables on the basis of the potential changes, which variables represent switch-on and switch-off delays of the switches along with dead times between the switch-on and switch-off of the switches of a bridge branch of the power converter, and

wherein the correction variables are added to the switching functions.

3. A method for determining an intermediate circuit current of a power converter with switches for converting a direct voltage into an alternating voltage, comprising:

measuring output currents of individual phases of the power converter;

measuring output voltages of individual phases of the power converter;

determining, based on the measured output voltages, potential changes of the output voltages of the individual phases from negative potential to positive potential and from positive to negative potential;

deriving switching functions of the individual phases that are assigned to the switches of the power converter as a function of the determined potential changes; and

determining the intermediate circuit current as a function of the measured output currents of the individual phases of the power converter and as a function of the derived switching functions that are assigned to the switches of the power converter.

4. The method according to claim **3**,

wherein the switching functions are derived as a function of the potential changes in that either constant values=0 or constant values=1 are assigned to the measured output voltages of the individual phases between successive potential changes, depending on whether the potential is negative or positive, such that switching functions, whose function values change over time between the value=0 and the value=1, are provided.

5. The method according to claim **3**,

wherein the deriving the switching functions is carried out as a function of the potential changes in that the output voltages of the individual phases are measured by delta-sigma analog-to-digital converters and digital bitstreams thus available for the individual phases represent the switching functions as a function of the potential changes,

wherein the measured output currents of the individual phases are weighted on the basis of the digital bitstream.

6. The method according to claim **1**, wherein the output voltages are measured by delta-sigma analog-to-digital converters.

7. The method according to claim **2**, wherein the output voltages are measured by delta-sigma analog-to-digital converters.

8. A device that is configured to carry out the method according to claim **1**.

9. A device that is configured to carry out the method according to claim **2**.

10. A vehicle comprising the device according to claim **8**.

11. A vehicle comprising the device according to claim **9**.

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